

### **Amendments to the Claims**

1. (Currently Amended) An isolated and purified bacterial reverse transcriptase (RT) of (SEQ ID NO: 1), which synthesizes msDNA, and ~~which~~ wherein said RT reverse transcriptase further comprises:

1) a sequence of amino acid residues as follows: Tyr-Xaa<sub>6</sub>-Asp-Asp of (SEQ ID NO: 50), wherein Xaa<sub>6</sub> is alanine or cysteine;

2) and further comprises a second sequence of amino acid residues as follows: Asn-Xaa<sub>1</sub>-Xaa<sub>2</sub>, wherein Xaa<sub>1</sub> is a hydrophobic residue selected from the group consisting of alanine, leucine, ~~and or~~ phenylalanine, and Xaa<sub>2</sub> is a hydrophobic residue selected from the group consisting of leucine, valine, ~~and or~~ isoleucine[[.]];

3) a third sequence of amino acid residues as follows: Ser-Xaa<sub>3</sub>-Xaa<sub>4</sub>-Xaa<sub>5</sub> of SEQ ID NO: 51, wherein Xaa<sub>3</sub> is a hydrophobic residue selected from the group consisting of valine, phenylalanine, leucine, or isoleucine, Xaa<sub>4</sub> is a polar residue selected from the group consisting of threonine, asparagine, lysine, or serine, and Xaa<sub>5</sub> is a hydrophobic residue selected from the group consisting of tryptophan, phenylalanine, or alanine;

4) a fourth sequence of amino acid residues as follows: Xaa<sub>7</sub>-Val-Thr-Gly, wherein Xaa<sub>7</sub> is a polar residue selected from the group consisting of arginine, glutamic acid, valine, or glutamine, of SEQ ID NO: 52; and

5) a fifth sequence of amino acid residues as follows: Gly-Xaa<sub>8</sub>-Pro, wherein Xaa<sub>8</sub> is selected from the group consisting of alanine, phenylalanine or serine.

2. – 4. (Canceled)

5. (Currently Amended) The bacterial RT-reverse transcriptase of claim 1 ~~which has the common subdomains 1 through 7 in Figure 14, which sequences are shown comprising an amino acid sequence selected from the group consisting of SEQ ID Nos~~NO.: ~~32, 33, 34, 35, 37, and SEQ ID NO.:~~ 32, 33, 34, 35, 37, and SEQ ID NO.: 38.

6. (Canceled)

7. (Currently Amended) An isolated and purified bacterial reverse transcriptase (RT) which synthesizes msDNA and which is essential for the synthesis of msDNA *in vivo*, said RT comprises a sequence of amino acid residues as follows: Tyr- Xaa<sub>6</sub>-Asp-Asp of SEQ ID NO.: 50, wherein Xaa<sub>6</sub> is alanine or cysteine, ~~as shown in SEQ ID NO: 50,~~ wherein said sequence is located in subdomain 5 shown in Fig. 14 at positions 175-191 of SEQ ID NO: 32, at positions 175-191 of SEQ ID NO: 33, at positions 175-191 of SEQ ID NO: 34, at positions 168-184 of SEQ ID NO: 35, at positions 159-175 of SEQ ID NO: 36, at positions 171-187 of SEQ ID NO: 37, and at positions 157-173 of SEQ ID NO: 38, and further comprising the 61 amino acid residues ~~as shown~~ indicated by black dots in the consensus sequence shown in Figure 14 ~~of SEQ ID Nos: 32-28,~~ wherein h is a hydrophobic residue and p is a small polar residue.

8. – 11. (Canceled)

12. (Currently Amended) The isolated and purified RT-reverse transcriptase of claim ~~[[4]]~~ 1 having an N-terminus and a C-terminus, which RT-reverse transcriptase has in the following order ~~starting from the N-terminus~~ to the C-terminus:

(1) ~~an a first amino acid sequence of Ser-Xaa<sub>3</sub>-Xaa<sub>4</sub>-Xaa<sub>5</sub>-(SEQ ID NO:51), wherein Xaa<sub>3</sub> is a hydrophobic residue selected from the group consisting of valine, phenylalanine,~~

leucine, and or isoleucine, Xaa<sub>4</sub> is a polar residue selected from the group consisting of threonine, asparagine, lysine, and or serine, and Xaa<sub>5</sub> is a hydrophobic residue selected from the group consisting of tryptophan, phenylalanine, and or alanine;

(2) a second amino acid sequence Gly-Xaa<sub>8</sub>-pro, wherein Xaa<sub>8</sub> is alanine, phenylalanine or serine;

(23) an a third amino acid sequence of Asn-Xaa<sub>1</sub>-Xaa<sub>2</sub>, where wherein Xaa<sub>1</sub> is a hydrophobic residue selected from the group consisting of alanine, leucine, and or phenylalanine, and Xaa<sub>2</sub> is a hydrophobic residue selected from the group consisting of leucine, valine, and or isoleucine;

(34) an a fourth amino acid sequence Tyr-Xaa<sub>6</sub>-Asp-Asp (SEQ ID NO:50) wherein Xaa<sub>6</sub> is a alanine or cysteine; and

([[4]]5) an amino acid, Xaa<sub>7</sub>, where Xaa<sub>7</sub> is a polar residue selected from the group consisting of arginine, lysine, glutamic acid, glutamine, and valine; a fifth amino acid sequence Xaa<sub>7</sub>-Val-Thr-Gly, wherein Xaa<sub>7</sub> is arginine, glutamic acid, valine or glutamine.

13-16 (Canceled)

17. (Currently Amended) The isolated and purified bacterial reverse transcriptase (RT) of claim 1 having an N-terminus and a C-terminus, which RT reverse transcriptase has in the following order starting from the N-terminus to the C-terminus; ~~an~~

a first amino acid sequence of Asn-Xaa<sub>1</sub>-Xaa<sub>2</sub>, where Xaa<sub>1</sub> is a hydrophobic residue selected from the group consisting of alanine, leucine and or phenylalanine and Xaa<sub>2</sub> is a hydrophobic residue selected from the group consisting of leucine, valine and or isoleucine;

an a second amino acid sequence of Ser-Xaa<sub>3</sub>-Xaa<sub>4</sub>-Xaa<sub>5</sub> (SEQ ID NO:51), wherein Xaa<sub>3</sub> is a hydrophobic residue selected from the group consisting of valine, phenylalanine,

~~leucine and or isoleucine, Xaa<sub>4</sub> is a polar residue selected from the group consisting of~~  
~~threonine, asparagine, lysine and or serine, and Xaa<sub>5</sub> is a hydrophobic residue selected from the~~  
~~group consisting of tryptophan, phenylalanine and or alanine;~~ an

a third amino acid sequence of Tyr-Xaa<sub>6</sub>-Asp-Asp (SEQ ID NO: 50), where  
Xaa<sub>6</sub> is a alanine or cysteine; ~~an~~ and

a fourth amino acid sequence of Xaa<sub>7</sub>-Val-Thr-Gly (SEQ ID NO: 52), where  
Xaa<sub>7</sub> is a polar residue selected from the group consisting of arginine, lysine, glutamic acid,  
glutamine and or valine.

18. (New) The isolated and purified bacterial reverse transcriptase of claim 1,  
wherein said reverse transcriptase is derived from *Myxococcus xanthus* or *Escherichia coli*.